Complete Summary

GUIDELINE TITLE

Routine chest radiograph.

BIBLIOGRAPHIC SOURCE(S)

Aquino SL, Khan A, Batra PV, Gurney JW, Haramati LB, MacMahon H, Mohammed TL, Rozenshtein A, Vydareny KH, Washington L, Winer-Muram HT, Woodard PK, Kaiser L, Raoof S, Expert Panel on Thoracic Imaging. Routine chest radiograph. [online publication]. Reston (VA): American College of Radiology (ACR); 2006. 6 p. [21 references]

GUIDELINE STATUS

This is the current release of the guideline.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Cardiopulmonary, respiratory or other condition for which a routine chest radiograph is recommended.

Note: This guideline concerns the daily routine radiograph only and does not include postprocedural or postsurgical radiographs.

GUIDELINE CATEGORY

Evaluation

CLINICAL SPECIALTY

Cardiology
Emergency Medicine
Internal Medicine
Pulmonary Medicine
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of routine chest radiograph for patient monitoring, evaluation after specific procedures, and documentation of the presence or course of a disease

TARGET POPULATION

Patients with a cardiopulmonary, respiratory or other condition for which a routine chest radiograph is recommended

INTERVENTIONS AND PRACTICES CONSIDERED

Routine x-ray, chest, portable

- Initial admission
- Immediately following catheter or tube insertion
- Follow-up for specific indications
- Subsequent follow-up for catheter or tube position

MAJOR OUTCOMES CONSIDERED

Utility of routine chest radiograph in detecting significant abnormalities affecting patient management

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of peer-reviewed medical journals and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by the Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Routine Chest Radiograph

Variant 1: Monitoring stable patient.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable, initial admission	9	Not for coronary artery bypass graft. Not for acute upper gastrointestinal bleeding.
X-ray, chest, portable, follow-up for specific cardiopulmonary indications	8	Clinical worsening only.
X-ray, chest, portable, routine monitoring	2	
Appropriateness Criteria Scale		

Radiologic Procedure	Appropriateness Rating	Comments
1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Variant 2: Respiratory failure. Patient receiving mechanical ventilation.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable, daily	9	
X-ray, chest, portable, follow-up for specific clinical conditions	9	
***Appropriateness Criteria Scale* 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate**		

Variant 3: Compromised respiratory function. Patient with endotracheal tubes.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable, immediately after initial tube placement	9	
X-ray, chest, portable, follow-up for specific clinical indications	9	
X-ray, chest, portable, subsequent routine for tube position	2	
***Appropriateness Criteria Scale* 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate**		

Variant 4: Central venous pressure catheter (CVP) insertion.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable,	9	

Radiologic Procedure	Appropriateness Rating	Comments
immediately following CVP insertion		
X-ray, chest, portable, follow-up for suspected clinical conditions	8	
X-ray, chest, portable, subsequent routine follow-up for catheter position	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Variant 5: Cardiopulmonary compromise. Swan-Ganz catheter insertion.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable, immediately after catheter insertion	9	
X-ray, chest, portable, follow-up for clinical indications only	8	
X-ray, chest, portable, subsequent follow-up for catheter position	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Variant 6: Potential cardiopulmonary compromise. Nasogastric (NG) tube insertion.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable, immediately after initial small bore feeding tube or NG	9	

Radiologic Procedure	Appropriateness Rating	Comments
tube (before first feeding)		
X-ray, chest, portable, immediately after NG tube insertion intended for suction or gas release only	6	Nonfeeding NG tube.
X-ray, chest, portable, subsequent follow-up for tube position	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Variant 7: Respiratory compromise. Chest tube insertion.

Radiologic Procedure	Appropriateness Rating	Comments
X-ray, chest, portable, immediately following tube insertion	8	
X-ray, chest, portable, follow-up for specific clinical conditions only	8	
X-ray, chest, portable, subsequent follow-up of tube position	2	
Appropriateness Criteria Scale **1 2 3 4 5 6 7 8 9** **1 = Least appropriate 9 = Most appropriate**		

Summary of Literature Review

Portable Radiographs in the Intensive Care Unit (ICU) Setting

Portable radiographs can be categorized as: 1) daily or routine radiographs for patient monitoring; 2) radiographs obtained after specific procedures; and 3) radiographs documenting the presence or course of disease.

Routine daily portable radiographs are indicated for patients with acute cardiopulmonary problems. In stable patients admitted for cardiac monitoring, or in stable patients admitted for extrathoracic disease only, an initial admission

radiograph is recommended, with follow-up radiographs obtained only for specific clinical indications.

Endotracheal Tubes

Very few malpositioned tubes are detected by physical examination. Routine radiographs immediately postintubation are indicated to insure proper positioning.

Central Venous Pressure (CPV) Catheters

A chest radiograph (CXR) after insertion of a CVP catheter is recommended to demonstrate proper placement and detect any complications. Beyond the initial insertion, follow-up radiographs have a low yield for revealing complications. Follow-up radiographs are suggested only when complications are suspected clinically.

Swan-Ganz Catheters

Portable radiography is suggested after catheter insertion. Once pneumothorax has been excluded and proper positioning has been assured, follow-up radiographs are not required except for specific clinical indications.

Nasogastric Tubes

Based on limited evidence, small-bore feeding tubes may, in a small but significant number of patients, be inadvertently placed in the lungs. This error is not always detected clinically and may lead to injection of feeding material into the lung, or tube penetration of the pleura, with subsequent pneumothorax. A CXR is warranted after initial nasogastric tube insertion and before the first feeding. Beyond the initial radiograph, follow-up radiographs are not required for management of stable tubes.

Chest Tubes

After insertion of a chest tube, a CXR is recommended to show the position of the tube, any success in drainage, and possible complications from insertion. Beyond this point, evaluation of tube position and function is warranted based on management of the pleural space and clinical indications.

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate use of routine chest radiograph for patient monitoring, evaluation after specific procedures, and documentation of the presence or course of a disease

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Aquino SL, Khan A, Batra PV, Gurney JW, Haramati LB, MacMahon H, Mohammed TL, Rozenshtein A, Vydareny KH, Washington L, Winer-Muram HT, Woodard PK, Kaiser L, Raoof S, Expert Panel on Thoracic Imaging. Routine chest radiograph. [online publication]. Reston (VA): American College of Radiology (ACR); 2006. 6 p. [21 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2006

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Thoracic Imaging

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Suzanne L. Aquino, MD; Arfa Khan, MD; Poonam V. Batra MD; Jud W. Gurney, MD; Linda B. Haramati, MD; Heber MacMahon, MD; Tan-Lucien H. Mohammed, MD; Anna Rozenshtein, MD; Kay H.Vydareny, MD; Lacey Washington, MD; Helen T. Winer-Muram, MD; Pamela K. Woodard, MD; Larry Kaiser, MD; Suhail Raoof, MBBS

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

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GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® *Anytime*, *Anywhere*™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

PATIENT RESOURCES

None available

NGC STATUS

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